A Work Project presented as part of the requirements for the Award of a Master Degree in Management from the NOVA – School of Business and Economics.

TECHNOLOGY ADOPTION AND DIFFUSION:

ACCESSING THE DETERMINANTS OF BEHAVIORAL INTENTION TO USE CHATBOTS

RITA ARAGÃO DE ESPINEY PATRÍCIO | 4179

A Project carried out on the Master in Management Program, under the supervision of:

Professor João Castro

3rd January 2019

Abstract

In recent years, chatbots experienced a big boom with the increase of online messaging platforms and advances in AI. Recently, it was recognized that despite the prosperous predictions, chatbots did not get the user uptake it was expected. This paper addresses the possible reasons behind this problem. 'Awareness', 'interest' and 'trust' were assumed to be the main determinants for chatbot usage. These variables were deepened with a survey-based questionnaire. Data shows that individuals are aware of chatbots but do not have a deep understanding of the subject. There is expression of interest and trust in chatbots, but mainly for sporadic simple tasks. It is concluded that individuals do not use chatbots as much as expected because there is a lack of proper knowledge on the topic, which in turn influences other variables, such as interest or trust.

Keywords: Technology Adoption; Chatbots; Interest; Trust

Acknowledgments

Foremost, I would like to thank my thesis advisor, Professor João Castro, not only for the continuous support of my thesis, but also for the life guidance throughout this period. I would also like to thank my mentor, Joana Cunha, for this enriching opportunity and for introducing me to this technological world. Finally, I would like to express my deepest gratitude to my family, specially to my parents, for the constant support and encouragement during my years of study.

Table of contents

1. Introduction

"Humans were given capable and inquisitive minds, so they endlessly seek better ways of doing things" (John Mayo, 1985). In addition to this *capable* and *inquisitive* aptitudes, the complexity of the man's essence is also characterized by a strong sense of curiosity and willingness to understand the vastness of the world. This constitutes the core reason behind the existence of technology and its constant development. Humans create and improve their creations with the aim of satisfying their needs – from the basic needs to the complex self-fulfillment ones. In this context, all sectors are experiencing an automating process. Tasks that once were performed by humans are now automated and digitalized becoming, in most cases, much faster and perfected.

Recent decades have witnessed great advances in technology across multiple milestones in History. The Agriculture Revolution brought pioneering techniques to increase production. Later, the Industrial Revolution powered specialized machines, signaling the beginning of mass production. More recently, Information Revolution brought humanity closer with a full share of information with global reach. However, something special is happening which may lead to a new revolution: advances in Artificial Intelligence (AI) are qualifying robots with self-learning skills and behaviors which would previously be associated only to human beings. Accenture (2017) defined AI as "*a constellation of technologies that allow smart machines to extend human capabilities by sensing, comprehending, acting and learning".* AI is disruptive and ground breaking and it is globally becoming the buzzword.

The growth is reflected in the numbers: funding for AI startups showed a boost of 60% since 2010 and the number of patents on AI technologies is growing at 26% compound annual rate, between 2010 and 2015 (Accenture 2017). Individuals are interacting with AI in their routines, without recognizing it. A study from Pegasystem discovered that 50% of people who say that had never interacted with AI before, actually did (Shep Hyken, 2017).

AI incorporates multiple fields, such as natural language processing, intelligent agents, computer vision, machine learning, expert systems, autonomous cars, voice recognition and chatbots (Accenture, 2017). These last ones – chatbots – are virtual agents that have been raising general interest as they introduce a novel manner of simplifying daily routines, save time and reduce costs. Because chatbots are the core of this research paper and because they constitute a complex field, they are deepened in a separate section below (Section 2. a.).

The process of technological evolution is thus becoming stronger as the man attempts to increase efficiency, minimize resources used and increase wealth and comfort (John Mayo, 1985). Additionally, technology is and will be an ongoing process as, in the words of Douglas McGregor (1960), The *"man is a wanting animal – as soon as one of his needs is satisfied, another appears in its place"*. *Curiosity* follows the same reasoning, as the human brain is in a constant state of discover and understanding. Therefore, technology is constantly evolving, and it exhibits a growing investment in R&D over the past years (The World Bank). As a result of the notable advances in the technological sector, besides being a necessity, technology has also become a part of ourselves.

Throughout time, the human being experienced an augmentation process, in the sense that he uses technological devices as an extension of both body and mind. The man is being enhanced with these *cyborg technologies*, either directly into their bodies (e.g. prosthetic limbs) or indirectly with other innovations that meet human needs (e.g. mobile phones) (Barfield and Williams, 2017). Hence, the human essence is being augmented cognitively, physically and perceptually (Artenis Kyriakou, 2018).

There is a consensus that technological advances are a core driver for humanity and that these developments are becoming inherent to human nature. However, the technological adoption progresses at different paces, depending on the type of technology and characteristics of the adopter. Alas, chatbots, for instance, are not capturing the user uptake it would be

expected (Cecilie Nordheim, 2018). Thus, identifying the issues behind the difficulty in technologies to thrive compels a meaningful exercise. This paper intents to address such issue for the particular case of chatbots.

Several possible reasons might explain the difficulties that technologies face to succeed. However, for this study, three core ideas are assumed to be the potential root problems. Firstly, individuals may not be aware of what chatbots are. Secondly, chatbots might not raise interest in users. Thirdly, trust constrains an important aspect of new technology adoption and the lack of trust might also be an explanation for this research problem.

Despite the high amount of opinions regarding multiple aspects of chatbots (usability, efficiency, customer usage), few have addressed the motivations behind customer usage. This paper attempts to contribute for this field by gathering relevant theoretical work and complementing it with an empirical study based on a survey-based questionnaire.

2. Literature review

a. Presenting Chatbots

This section intents to decode the concept of chatbots, present the evolution since the first chatbot was created, briefly explain what is behind building a chatbot, discuss safety issues and evaluate the current situation on where and how chatbots are being used.

i) Introducing chatbots

Chatbots, also known as intelligent virtual assistants, digital assistants or conversational interfaces (Robert Dale, 2016), are natural language processing (NLP) algorithms created to simulate human-human conversations (Lara Piccolo et. al., 2018).

Behind the, what may look like, complex software architecture, the idea behind the chatbot is simple: to extract and identify pieces of information provided by the user and reply with another piece of information for which the bot is programmed for, either by voice or text.

Users can interact with chatbots through messaging apps, chat windows or by voice. (Accenture, 2016).

Automating everyday activities within companies increases productivity levels and improves costumer engagement, which triggered multiple sectors to value the potential of chatbots. In addition, this boost is becoming even stronger due to the current improvements undertaken in chatbots – they are not necessarily mere response platforms anymore, because AI is refining bots into more powerful tools, by giving them capabilities of understanding the customer and learning with the process, increasing its capacities (Accenture, 2018).

A SINTEF (2018) study states that *"chatbots are not a one-solution-fits-all technology"*. Intentions of use vary across user, company, business and circumstances and, thus, chatbots should be strategically planned to satisfy those different necessities (Petter Bae Brandtzæg and Asbjørn Følstad, 2018). It is difficult to find a worldwide accepted differentiation among those chatbots. However, for the purpose of this paper, Accenture's classification is suitable. Accenture classifies bots into four different categories: informational, enterprise productivity, transactional, device control (Accenture, 2018) (Appendix 1).

Apart from the functional capacities, virtual agents also benefit from not having the same necessities human agents do. Chatbots do not require rest, sleep nor vacation periods – they are available 24/7 – they do not experience emotional instability (such as feeling tired, unfocused or bad-tempered), and they are not biased when interacting with customers (Shep Hyken, 2017). A study revealed that people feel more comfortable discussing sensitive topics with a chatbots than with a human agent (Jennifer Zamora, 2017), proving that besides the higher availability, the robotic service might also interest the user better than human service.

ii) History

Thorough the last two years, chatbots have become a matter of increased interest. They are considered one of the buzzwords for 2018 (Alexandre Ouellette, 2018), *"an increasingly*

important part of the digital customer service mix" (Accenture, 2016), *"a powerful weapon in the business arsenal"* (Forbes, 2018). However, despite the recent hype surrounding this topic, chatbots started being developed and studied long ago, during the 1960s, and have gradually been improved in features.

The first chatbot ever made was Eliza, created by Weizembaum in 1966. Eliza simulated a psychotherapist which operated with a stimulus-response approach. Later, in 1972, Parry was created with the personality of a patient with paranoid schizophrenia and interacted with Eliza, simulating a regular doctor-patient appointment and marking the beginning of bots' interactions. More recently, some of the most commonly known chatbots were developed with outstanding features, such as IBM's Watson (2006), who beat the world champions in Jeopardy, Apple's Assistant Siri (2010); Amazon Alexa (2015), which is becoming a new member of the family, and Google Assistant (2016) (Collette Curry and James Dominic O'Shea, 2011).

The future was not bright for every famous virtual assistant and some gained a reputation for the wrong reasons. Microsoft launched a chatbot for Twitter, named Tay (2016). Unfortunately, the company was forced to shut Tay within 16 hours of its launch as the bot became offensive, racist and xenophobic. Behind this failure were *trolls*, who attacked the system with provocative information. The same way chatbots learn trough AI with their interactions, Tay learned with these inflammatory behaviors, proving that intelligent technologies must be closely watched to avoid being exposed to the wrong influences.

Thousands of chatbots were developed, for multiple goals and with different quality levels. Their value is still a matter of controversy as well as the criteria to evaluate them. Nevertheless, some chatbots apply to competitions to try to prove their capacities.

One of the most well-known competitions in the area is the award of the Loebner Prize, which takes place every year, since 1991. It evaluates interactions with chatbots and honors the ones which appears to be more human-like. It uses the Turing Test, created in 1950 by Alan

Turing, who developed his studies based on the question *"Can machines think?"* (Alan Turing, 1950). This test consists in three rooms: one with a human contestant, a second one with a chatbot contestant and a third one with a human judge. While chatting with both contestants, the judge must understand which one is the human and which one is the chatbot. A machine succeeds the test if it can trick at least 50% of the judges that it is human. Even though human-like characteristics are a relevant aspect in a chatbot, specially to entail trust in the user (Cecilie Nordheim, 2018), it is not enough to evaluate the potential of a bot, which can be intelligent and effective for its use, showing some human traits but still not being perceived to be one.

Regardless of the advances that were made in chatbots, the big boom happened recently, mainly for two motives. First, in April 2016, Facebook launched a Messenger platform which allows Facebook users to interact with chatbots. In 2017, Facebook had over 1.2 billion active users per month (Brandtzæg, Petter Bae and Asbjørn Følstad, 2018), showing that it is an effective tool for reaching potential chatbot users. By the end of 2016, Facebook Messenger counted beyond 30,000 chatbots available (Accenture, 2016). Nowadays it is possibly to interact with chatbots in different platforms (Facebook Messenger, Slack, WeChat, Telegram, among others) and use them to make orders, reservations, ask for advices, and much more without having to download an extra app nor accessing the website.

Second, this recent boom of chatbots is also linked with the major advances being undertaken in AI. Developers are taking advantage of the great progresses in machine learning and deep learning, which easily use huge amounts of data and a smooth processing power that incomparably improves the understanding and decision-making processes.

iii) Technical and Strategic Planning

The technical architecture to build a chatbot does not constrain an extremely complex task. It requires a server (two of the most commonly used are Azure or Amazon) and at least one messaging platform (Facebook Messenger, Telegram, Slack, etc.). After connecting the

platforms to the server, the server receives and interprets the messages sent by the platforms and processes the text with natural language processes. According to what the chatbot knows about the user, and regarding the context of the conversation, it provides an answer.

Chatbots may, or may not, include AI in their operations. They can function with a simple pattern of matching inputs with a response or being enriched with AI techniques to upgrade the state of the conversations, with self-learning practices, which lead the chatbot to develop itself with information acquired during the chats (Deloitte, 2018).

Besides the technical architecture, building a chatbot also requires a strategic planning trough which it is decided which features the virtual assistant will present and how they will be offered. The bot does not need to be a straight machine, it might be created with a specific personality and even a name. Even though this does not directly contribute to the quality of its performance, studies have proved that it helps the user to build trust on the machine (Cecilie Nordheim, 2018). Users empathize and maintain a relationship in smoother way if the bot shows personality. That personality should be adapted according to the purpose of the bot, in a way that it can be taken seriously for the task it is performing and the target it is aiming for.

iv) User Safety

Nowadays individuals deposit their life information in mobile devices and computers which makes digital accounts attractive for criminals. Attacks happen frequently, either in a bigger scale (governments and companies) or a smaller one (individuals). This vulnerability makes it plausible for users to feel concerned about interactions with chatbots, particularly with more sensitive situations, such as financial issues. Thus, making sure that chatbots are safe, and making sure that users are aware of such security, is a core stage of the chatbots preparation.

Most chatbots are available in messaging services such as Facebook Messenger, Slack, or Telegram which, from a technical perspective, provide end-to-end encryption that makes it

impossible to decrypt messages sent. Besides encryption, it is important to assure transport level security, such as https, guaranteeing a secure link between the user and the platform.

The continuous chatbot development is creating opportunities for the appearance of additional features, which can constitute more delicate topics, when discussing trust levels. Individuals feel safe having personal conversations with these platforms but that does not necessarily imply the same feeling of safety when undertaking, for instance, financial transactions (Pulse Chat, 2017). In the US, for example, Uber is integrated in Facebook Messenger and provides the option of making the payment trough the platform. In situations as such, users will certainly have the need of feeling more trust than when chatting with a friend (even though the right of privacy should apply the same way) (Ben Rossi, 2017).

For situations of highly regulated industries that contain sensitive information, such as healthcare and finance, there are other security methods that can be applied such as 2FA, through which users have to verify the veracity of their identity with two separate channels; behavior analytics; biometrics, such as fingerprint or retina scan and AI (Ben Rossi, 2017).

v) Where chatbots are being used

Progressively, chatbots are thriving trough messaging platforms, complementing businesses from small to large scale, across multiple sectors (Accenture, 2016). They play a critical role mostly in customer service: a study from Servion (2017) predicted that, by 2025, 95% of customer interactions will be handled by AI applications.

Chatbots have been settled in a variety of online environments with a high impact on e-commerce (Cecilie Nordheim, 2018). An interesting and well succeeded example is Sephora's chatbot, available on Kik. Customers can purchase their goods without leaving the messaging platform and still enjoy a personalized customer service that provides advices according to what the customer is looking for.

Moreover, the banking industry is also adopting virtual assistants to improve customer service and provide transactional support. By redeploying simple tasks – like bank account consultations – from human assistants to virtual assistant, the business allows representatives more time to focus on more sensitive subjects where chatbots are not yet ready to intervene. Bank of America created Erica, a virtual assistant available through their mobile app. With Erica, customers can view bills, schedule payments, transfer money, among other services. Erica, *"the first widely available AI-driven virtual assistant in financial services"*, has been a success, and surpassed the 1 million users in July 2018 (Bank of America, 2018).

In the healthcare industry, chatbots are also gaining space and importance by taking responsibility of standard situations that allow to reduce, until certain extend, the burden of some doctors. Chatbots can help screening patients, help them to manage and clarify medication matters or provide advice in emergency situations (The Medical Futurist, 2018). Babylon Health, founded in 2013, is an online medical consultation and health service. It is prepared with a database of common medical knowledge that is crossed against the information provided by the patient, using speech recognition. The chatbot can provide advice and appropriate course of action to the patient or, if needed, transfer the patient to a video call with a real doctor.

Among all sectors which prevail from using chatbots, the travel industry is certainly one of which benefits the most. This industry is confronted with a tough competition, either from hard traditional rivals or by the new entrants. Thus, in order to succeed, there is a need of providing an excellent customer service which can be enhanced with chatbots (Accenture, 2017). A success story is KLM chatbot, available through Facebook Messenger. The airline is faced with thousands of weekly requests, in multiple languages. Facing a constant growth of the business, KLM felt the need of improving their customer service in quality, personalization and speed. Thus, they have implemented the virtual assistant where customers are able to clarify doubts, get their boarding passes and check flight status (Mariana Marques, 2018).

Chatbots have revealed to be a game-changer across industries and they are positively taking advantage of the growing interest shown by users. Chats, mobile apps and social media are substituting traditional telephone support which loses its position as a preferred channel. This global changing point refers to an inevitable growth of the chatbot industry which has already an estimated value of over US$1 billion and it is forecasted to increase to US$1.86 billion by 2020 (Accenture, 2017). Nowadays, the success of a business goes hand in hand with technology adoption and development. Thus, enterprises must be aware of the emerging opportunities and customer needs, so they do not to stay behind competitors.

vi) Current state

In theory, chatbot implementation seems to be an optimal strategic move for industries, as they show a great potential of supporting the business in a less expensive, fast and effective way. Users are aware of those benefits and show receptiveness towards the idea of interacting with virtual agents. A study conducted by Facebook revealed that 63% of people would feel more positive about a relationship with a business if there was the possibility of chatting with that business, and 55% of the them said they would more easily trust that business under such conditions (Accenture, 2017). To meet this demand, businesses are willing to invest in this type of technologies. As one of its Top Strategic Predictions, Gartner forecasted that over 50% of enterprises will spend more on bots and chatbot creation than app development (Petter Bae Brandtzæg and Asbjørn Følstad, 2018).

Nevertheless, and despite all the bright predictions surrounding chatbots, user uptake seems to be lower than expected (Cecilie Nordheim, 2018). The potential of chatbots have not yet been realized as it was expected to be. There might be several reasons to explain this unpredicted situation.

Firstly, the lack of popularity among the common user might have to do with the awareness – or unawareness – of chatbots, i.e. "**Are people aware of what chatbots are?"**

Secondly, businesses tried to rapidly keep up with the chatbot boom and desired to promptly implement a chatbot, either to be pioneer in their field or simply to match their rivals' level (Petter Bae Brandtzæg and Asbjørn Følstad, 2018). This precipitation and lack of strategic and technical planning led to inefficient and purposeless chatbots, which might have caused people to feel demotivated and not interested in using chatbots. Thus, these evidences arise the question "**Are people interested in using chatbots?**". Lastly, user trust might be a critical success factor for chatbot usage (Cecilie Nordheim, 2018). Therefore, to evaluate the level and significance of trust for chatbots usage, one must explore the question "**Do people trust chatbots?".**

b. Factors that influence customer usage

For simplification purposes, the different variables that can influence chatbot customer usage are grouped under three *macro-variables*. As such, this paper decodes the impact of *knowledge* (which includes concepts such as awareness and understanding), *interest* (comprising usefulness and ease of use) and *trust* (security, attitudes towards security). These concepts are deepened in the section below.

i) The concept of *knowledge*

Evaluating the awareness towards a notion is an objective and straight reasoning. An individual either is aware of a certain information, or not. However, the degree of knowledge relative to a certain subject varies from person to person. Thus, there is a differentiation between these concepts of *awareness* and *understanding.* In particular for the case of technology innovations, it is not sufficient for individuals to be aware of the new inventions, as this will most probably not lead to a broad adoption. Instead, it is required to spread, in potential users, deeper understandings of those inventions, being about the main purposes they can serve, the basics on how to use, the risks that can be inherent and how to bypass them.

Nevertheless, for a new technology to generate awareness or understanding among its target audience, it requires a proper diffusion. Technological advances enhance humanity

growth and progress, but for this purpose to be reached, innovations must be commonly adopted (Bronwyn H. Hall and Beethika Khan, 2003). The simple availability of technology does not lead, *per se*, to a more efficient use of resources, increase of productivity or economic growth. It is required a process of acceptance and adoption by the users, which usually occurs when these innovations are perceived to potentially add value (Debra Rubas. 2004).

The adoption of a new technology results from a deliberation process that involves comparisons regarding the actual use, or not, of that technology and the costs involved (Bronwyn H. Hall and Beethika Khan, 2003). In this sense, *costs* do not imply merely a relation to money, but also potential risks associated. Dealing with risk is a sensitive matter and varies across individuals. Lin (1991) refers that, especially with precarious and erroneous information, adopting new technologies might attain a certain level of risk. However, this risk is most probably ignored (or accepted) by better-educated people, who are willing to devalue the weight of that risk and adopt the innovation. (Lin 1991, as cited in Debra Rubas, 2004)

Deciding on adopting a new technology does not necessarily imply an immediate choice. Instead, the decision can be differed throughout time, while the potential user evaluates the benefits and risks associated in order to make a weighted decision, or because the user is postponing it to a period in time when adopting that technology will better suit his interests (Bronwyn H. Hall and Beethika Khan, 2003).

The intention to use new technologies depends on different variables: with an objective character (practicality-based and efficiency-based reasons) and from a subjective character (culture and beliefs). The TAM model identifies, *perceived usefulness* and *perceived ease of use* as the primary determinants of behavioral intention to use technology (PG Munasinghe, 2014). However, studies have complemented the TAM model with the variable *trust*, which was believed to be missing in the model. Dahlberg et. al (2003) concluded that security, trust, trust attitudes and concerns related to security enhanced the model (Tomi Dahlberg, 2003).

ii) The concept of *interest*

Technology is broadly entering individuals' lives. Being faced with all the great new improvements, it is expected that individuals feel interested in using such technologies. However, innovations do not generate the same demand among everyone: different innovations arouse different levels of interest. Therefore, it is important to understand the concept of *interest* and what stimulates intention to use new technologies among different individuals.

"A classical question in social science is 'What causes people to act the way that they do?' An equally classical answer is 'their interests'" (Richard Swedberg, 2005). *Interest* is present across social sciences (politics, economics, management, etc.). Thus, before any launch, being of a product, a service, an idea, a political movement, etc., it is required to study the interest of the general public, if the aim of such launch is to gain popularity or to generate sales.

The concept of *interest* has had some attempts of definitions, but it is, as in the words of Richard Swedberg (2005), taken as a *proto-concept*, in the sense that it is discussed without much awareness nor conceptual precision. However, for the purposes of this paper, the focus is not to deep into the concept in a sociological approach, but to understand what is triggering interest in individuals – in the sense of generating motivation and intention to use new technologies. Studies have been highlighting potential influence factors, but the general ideas all end up converging into two main ideas: *perceived usefulness* and *ease of use*.

Yolanda DuPree (2015) investigated the determinants of intention to use new technologies. The study concluded that *ease of use* and *perceived usefulness* would have a positive impact on the *intention to use*, which in turn would positively impact *actual use*. Petter Bae Brandtzæg and Asbjørn Følstad (2017), conducted a similar research, specific for the intention to use chatbots. Conclusions draw from his research indicates that *ease of use*, *speed* and *convenience* are the main reasons for using chatbots.

iii) The concept of *trust*

"The idea of trust has had a centuries-long intellectual career" (A. Silver, 1985). For decades, *trust* has been a subject of study for sociologists, psychologists, economists and other experts from different disciplines, but a worldwide accepted definition is still nonexistent. Trust has been studied across cultures, organizational environments, consumer behavior, among others, and yet it remains a subjective notion, a topic of further discussions.

Several attempts were made to define this concept. The Oxford Dictionary describes trust as a *"firm belief in the reliability, truth, or ability of someone or something"*. Davis Mayer et. al. (1995) refer to trust as a willingness of vulnerability towards someone or something. Rousseau, Sitkin, Burt and Camerer (1998) relate it to positive expectations about another's behavior. From a different perspective, Barber (1983as cited by Hosmer, 1995) alleged that trust is so well and commonly understood that no one should be concerned to give it a proper definition. Despite the wide range of attempts to define trust, that slightly vary from one to another, trust can be characterized with three aspects.

Firstly, the multiple attempts of defining trust all collide to a common awareness of a positive acceptance of vulnerable situations in which one side believes that the other will take care of his/her interests (M.A. Hall et. al., 2001).

Secondly, trust is approached in situations referring to the actions of others. Generally, humans do not place trust on their own actions, they merely perform them. Although, there are exceptions related to, for example, long term achievements or situations when people lose control of themselves either for psychological motives, addictions or extreme tiredness (Piotr Sztompka, 1999).

Thirdly, and most important for the aim of this paper, the concept of trust refers to the future. During his study, Luhmann (1975) states that trust should not only be associated with a

traditional society but with a modern and evolutive society. We see trust as a vision of the future, related to actions which we have not yet performed nor watched being performed.

Trust is necessary to face the unknown. This applies for multiple situations in our lives: interacting with others, starting a relationship with a financial institution and, particularly relevant for this study, willingness to use new technologies. If humans do not trust technology, they will not risk using it if they have other options; even if those options are slower, more expensive or less complete. The risk of using something not worthy of our trust, usually does not compensate for the benefits that can be attached to using them.

Trust is indeed a concept that may seem commonsensical, as Barber (1983, as cited by Hosmer, 1995) mentioned. However, its deep understanding may go beyond our human perception as it becomes, at some extend, irrational for us. The Milgram experience is a good illustration of such complexity. It was showed that humans trust the authority in such a way that they were willing to harm other human beings (S. Milgram, 1963). The feeling of trust took, for most, their sense of right or wrong, thus showing what the power of trust can instill.

3. Methodology

a. Problem statement

The purpose of this research is to understand why chatbots adoption is indeed less substantial than expected after the big boom in 2016. Following this problem statement, three research questions are posed. As a first approach, it is necessary to realize if people know what chatbots are. Posteriorly, one must understand if people have interest in using chatbots and under which circumstances. Finally, this paper addresses the level of trust people perceive on chatbots and how this can influence chatbot usage. To summarize, as abovementioned, 3 research questions aim to be answered in this paper: (1) *"Are people aware of what chatbots are?"*; (2) *"Are people interested in using chatbots?*" and (3*) "Do people trust chatbots?"*.

b. Data collection

For research purposes, a mixed method was chosen. Secondary data was gathered from different academic research papers and scientific publications. Also, relevant information came from updated blogs and newspapers, which proven its importance for the analysis, given the still recent global interest in the topic. Those provided the base of the research and the tools to define the assumptions for the research questions.

Subsequently, quantitative data was gathered through survey-based questionnaires. The questionnaire was available online for a one-week period. Due to impracticality, or even impossibility, of inquiring the whole population, the sample used is random but also convenient, given that the survey was set available to my contact network and asked to be spread by them. As such, it is limited in the sense that it might be considered biased. This quantitative approach was chosen as it was preferred to gather more objective and numerous answers that would provide the facts desired. Even though this type of technique can be quite limiting and does not allow for a deeper explanation behind the numbers, this method seem to be the most suitable for the purpose. To avoid, at a certain extent, this limitation, some of the questions displayed had the option *Other*, to allow the respondent to go beyond the options provided by the survey.

4. Presentation of the results

a. Sample

The online questionnaire totalized 266 answers, and all of them were considered for the analysis, given that there were no signs of unreliable data. Most of the respondents were female, 60.5%, and the remaining 39.5% were male. The biggest proportion of respondents are aged between 21 and 29 years old (43.6%), followed by a range of 26.3% with 50 years old or older. Regarding education level, 57.5% of the enquired have completed a graduate degree and 24.1%, a bachelor's degree. The majority of the respondents are Portuguese (83%) and the remaining

17% come from 19 different countries - Brazil (20%), Spain (11%), Germany (9%), France (9%).

b. Technology awareness

As a first approach, the survey categorizes the sample according to how respondents perceive their own level of technology adoption. 54% answered that they are *"interested in technology – it is essential to move forward"*, 28.2% believe they *"adopt new technologies when they are commonly accepted"*, 16.2% consider themselves as *"technology enthusiasts – always up to date with new innovations"* and only 1.1% *"feel uncomfortable with new technologies"*.

The sample considered for this study is apparently available to embrace new technologies and shows a moderate interest in keeping up to date with innovations. Thus, with an inductive point of view, it would be expected that this openness and awareness towards new technologies would be reflected the same way – or similarly – regarding chatbots.

c. Chatbot awareness

As for approaching the first research question *"Are people aware of what chatbots are?"*, all respondents were directly asked *"Do you know what chatbots are?"*. 38% of them answered *"Yes"*, and the remaining said they did not know or that they were not sure what to answer.

Taking into account that some people might be familiarized with the idea of chatbots but not with the concept itself, respondents who did not answer *"Yes"* to the previous questions were faced with a visual and written explanation to briefly provide an idea of what chatbots are and the functionalities they offer. Posteriorly, the question was displayed again: *"After this explanation, do you maintain your previous answer?"*, to which nearly half of the enquired (48.5%) replied that actually they did know what a chatbot is. These results lead to conclude

that the majority of the total respondents knew what chatbots are (68%), some of them were just not associating the idea to an actual name.

Lastly, one may conclude that there is a relationship with the variable *age*. In fact, 60% of people under 30 years old know what chatbots are and only 43% of people over 30 years old do so. Only 21% of people under 30 years old say they do not know what chatbots are while nearly twice the value (41%) of people over 30 years old affirms not to know.

d. Interest

To evaluate the second research question, *"Are people interested in using chatbots?"*, the following topics were studied: previous usage and its frequency, interest in using a chatbot for a first time or continue using and preferable situations to use a chatbot.

Among people who are aware of what a chatbot is, 71.3% have used one before. However, it does not imply a consistent usage, as 52.7% of them have used a chatbot less than 5 times. Only 20.9% of respondents say they use a chatbot consistently, either daily, weekly or monthly. Nevertheless, 96.9% of respondents are interested in using a chatbot again.

People who have never used a chatbot before, justify it mainly with two reasons: *"It doesn't come to my mind using a chatbot"* (42.3%) and *"I don't know in which cases I can use a chatbot"* (40.4%). Such reasons imply a lack of knowledge towards chatbots and not adverse reasons for not using one. Accordingly, when those same respondents were asked if they would be willing to use a chatbot, 69.2% said *"Yes"*.

Moreover, among people who did not know what a chatbot is, 84.7% said that they would use a chatbot after the explanation provided. From the 15.3% who said they would not use a chatbot, the main justification was *"I don't feel comfortable interacting with a robot"* (61.5%).

People who have previously used a chatbot, did it mainly for *"resolving a complaint or problem"* (47.3%), *"getting detailed answers or explanations"* (33.3%) and *"finding a human*

customer service assistant" (29.5%). Respondents who have not used a chatbot were asked in which situations they would be interested in using one. Among the different options, the most popular ones were *"getting a quick answer in an emergency"* (62.5%), *"making a reservation (e.g. restaurant or hotel)"* (62.5%) and *"getting daily information (e.g. weather forecast, traffic)"* (62.5%).

Finally, to evaluate the level of interest felt by potential chatbot users, all respondents were asked to rank their level of interest in different situations, being 1 *"not interested at all"* and 7 *"extremely interested"*. This question was not mandatory and, as such, was not answered by the totality of the respondents. People showed to be very interested in bookings (such as flights or restaurant reservations) and ordering food with a chatbot. Additionally, they showed little interest in getting financial advice from a chatbot.

e. Trust

Evaluating trust might be a challenging task. However, and as an attempt to do so, the questions posed tried to consider the conclusions draw in section 2.b.iii. Thus, illustrative situations used to evaluate the level of trust, considered vulnerable circumstances, related to a third party (in this case, the chatbot) and referring to future events. Primarily, respondents were directly asked to rank their level of perceived trust when using a chatbot. With a scale from 1 to 7, being 1 *"I absolutely do not trust chatbots"* and 7 *"I totally trust chatbots"*, 36.4% raked their level of trust with a 5. Posteriorly, respondents were asked to rate their overall experience when using chatbots. Again, with a scale from 1 to 7, being 1 *"terrible experience"* and 7 *"amazing experience"*, 44.2% rated the experience with a 5. Interestingly, both present similar distributions, showing that the quality of the experience potentially influences the trust felt by the user.

To understand the extent to which perceived trust could vary across situations, respondents were asked to classify their trust level in different circumstances. The goal was to

compare if people feel different vulnerabilities when using chatbots for personal/functional situations or more sensitive ones, such as healthcare and financial matters.

Results show that people are extremely uncomfortable in trusting chatbots for situations that are deeply personal, such as being set up on a date. However, cases like this would require a deeper analysis to understand if the lack of trust is related to technology involvement or, instead, to cultural values which might recriminate these types of behavior.

There is a great disparity between how people feel when using chatbots for personal/functional situations and for more vulnerable situations. In fact, most of respondents agreed to trust a chatbot to book a restaurant table for a birthday party and to set up the alarm in the morning, but they disagreed or strongly disagreed that they would trust a chatbot for health advice or financial matters (such as open a savings accounts or getting investment advice).

f. Additional remarks

As for evaluating how individuals deal with selecting between a human agent and a virtual agent, two hypothetical scenarios were presented – one involving a financial situation and the other involving a healthcare issue. In the first scenario, respondents had to choose how to provide their credit card details to a travel agency. Being able to choose between a human agent (with a limited period of assisting hours and a waiting time) and a virtual agent, 66.2% chose the chatbot. In the second case, respondents were faced with a hypothetical situation where they got sick during their vacation. Thus, they had to choose between a human agent and a chatbot to contact the healthcare insurance and solve the situation. Again, the chatbot got most of the votes, with 72.9%.

The last question displayed the home page of Ryanair's website with a chatbot window. Respondents were asked to choose the sentence with which they feel more related to, when they see a chatbot displayed in a website. This question intended to analyze how individuals' minds

are, or not, open towards the idea of chatbots, in their daily routines. Nearly half of the respondents said that they did not pay attention to see if a chatbot was in the website (30.5%), they close it so safe space on the screen (7.9%), or that they misperceived it and believe it was a commercial (5.3%).

5. Discussion

The previous section presented an analysis of the data collected from the questionnaire which allows to draw conclusions related to the three research questions that were posed.

As for the first research question *"Are people aware of what chatbots are?",* one may conclude that it exists general *awareness* towards the concept of chatbots. Even though some individuals do not necessarily recognize the term *chatbot*, the majority is familiarized with the idea. However, results show that the level of actual *understanding* about chatbots is not so high. For instance, respondents who have not used a chatbot before, justify it with not knowing in which situations they can use one, or with the fact that it is not inherent and intuitive in their minds to use a chatbot.

These flaws in general understanding presupposes that the process of diffusion was not strong enough to generate the necessary knowledge for the audience to adopt this technology. It seems to be that chatbots have not yet entered people's minds, in the sense that, so far, it is not innate for individuals to make use of virtual agents. Apart from not intuitively recall the option to use a chatbot in daily routines, data also shows that when accessing a website, individuals do not look for a chatbot or they tend to ignore it, indicating that they do not yet perceive chatbots has another technological complement of themselves.

Concerning the second research question *"Are people interested in using chatbots?"*, there are evidences that people show curiosity and willingness to use chatbots. However, this *intention to use* is not being translated in the desired *actual use,* as it would be expected to happen. Even though a great proportion of the respondents have used a chatbot before, nearly

80% of those do not make a consistent use of chatbots. They have tried once or have used them a few times, sporadically. This may be explained by the fact that most of the individuals who have used a chatbot, did it for resolving a complaint or problem, which usually does not happen in a consistent basis.

Data shows that, according to the abovementioned characterization, individuals who have used a chatbot before are mostly interested in informational chatbots and the ones who have not used a chatbot yet show interest in using informational and transitional chatbots.

Enterprise productivity chatbots are not mentioned as they do not play an important role for this paper that aims to evaluate the relationship between the regular user and the chatbot and not specifically the relationship of an employee and a chatbot in a work routine context. Besides, respondents could have exposed interest in this type of usage by adding it in the option *"Other"*, which did not occur. Device control chatbots are not mentioned either but then again respondents did not show further interest in this particular category. This type of chatbot is not yet broadly available and it does not represent the regular usage situation.

To evaluate the level of trust that individuals perceive to have towards chatbots, respondents are divided in two groups: the ones who used a chatbot before and the ones who did not.

Among people who have used a chatbots before, data showed that the level of trust, evaluating in general conditions, is relatively high. However, when specifying for particular cases, one can see that that level of trust is superficial because people feel comfortable in trusting chatbots for trivial activities but the same does not happen when it relates to more vulnerable situations (personal life, healthcare or financial issues).

Regarding respondents who have not used a chatbot before, their main justification is not feeling comfortable interacting robots, showing that there is still a way to go for people to fearlessly adopt new technologies.

6. Limitations

This research paper presents some limitations which might condition the reliability and quality of its analysis and conclusions. Because the analysis is based on a survey research, the information collected implies an oversimplification of social reality. One may not entirely trust an answer given at a questionnaire which is undertaken under neutral situations. For instance, even though questionnaires are anonymous, people often feel embarrassed to admit they are not aware of a certain subject. Moreover, questions related to money do not illustrate reality, as it is different to think under a hypothetic situation and actually seeing money at risk. Thus, the validity and reliability of the data analyzed above might be, until a certain extent, biased.

After the survey analysis, numbers showed that there is a correlation between chatbot awareness and level of education. As such, and given that the great part of the respondents showed a high level of education, one might assume that the results can be too positivistic.

Finally, evaluating subjective concepts, such as trust and interest, is a tricky task. Trying to rate these feelings from 1 to 7 might be able to capture the general idea of the respondents' feelings, but it is certainly not entirely accurate, as people do not perceive these feelings in a scale, in the same way.

7. Further research

This paper attempts to collect new information on chatbot usage and the reasons that drive individuals to feel, or not, interested in virtual agents. However, the conclusions drawn are limited by the reasons abovementioned. As such, to expand the potential of this research topic, additional studies can be taken under consideration.

Firstly, to avoid the limitations attached to questionnaire studies, it would be appropriate to conduct in person experiments, to observe individuals interacting with chatbots. Moreover, experiments should involve real money to truly evaluate if individuals feel or not safe by using a chatbot when real money is in hand.

Moreover, because the chatbot trend is considerably new for the general audience, even though people seem to be aware of its existence, they show a superficial knowledge on the subject. Therefore, perceived trust is different when comparing to situation in which individuals deeply know about the topic. It would be interesting to conduct a research on stronger relationships to evaluate how trust in build in such cases. Also, the variable *interest* should present new results because as people know more about the subject their interest should also evolve.

Finally, this paper focused its research on the relationship between the chatbots and the common user. However, further research should study productivity chatbots, meaning the relationship enterprises and employees create with chatbots and the extent to which virtual agents can boost the business, when used internally.

8. Conclusions

After the big chatbot boom, in 2016, it was expected for chatbots to be widely spread and adopted, but despite the positive predictions and promising characteristics, chatbots did not achieve the success it was anticipated. As a first approach to identify the possible reasons behind this problematic, three potential explanations were considered: individuals face a lack of knowledge towards chatbots, they have little interest in using them, they feel a low level of trust or a mix between these variables.

It was proved that individuals are generally aware of chatbots existence and main characteristics, even though there is still a proportion who does not relate the virtual agents to the term *chatbot*. However, there seems to exist a lack of a deeper understanding of what this technology may involve. Users seem to be clarified on what respects the possibilities to use chatbots.

Moreover, it can be concluded that individuals show interest and willingness to use chatbots, but these intentions are not translated in the desired actual use. Interest evaluated in

different situations was relatively high, but mainly for simple daily situations. Also, individuals seemed happy with previous chatbot usage.

The level of interest for each situation presented a similar distribution to the level of trust. People trust chatbots for casual situations but the same does not happen when the risk is higher. As such, *trust* is superficial, which can explain the fact of the low level of *actual use.*

The fact that *interest* and *trust* appear to be superficial is by itself a strong justification for the low user uptake. However, the problem seems to have its roots in *knowledge*. Because people are not completely familiarized with the concept, they do not allow for chatbots to enter their minds as a technological continuation of themselves, as it happens with many other innovations. This superficiality will certainly affect the levels of *interest* and *trust* which in turn lead to a lower *actual use.*

For chatbots to achieve the desired level of adoption, education towards the topic need to be boosted. Individuals must to be aware of how and when to use virtual agents and how safe these interactions can be. This process on different factors and it is not easy to predict how long it can take and if it will be successful. One the one hand, companies that use chatbots for their businesses should do so in a careful considered way, to avoid useless and defective chatbots which may lead to a wrong perception in users. Also, they have the responsibility to assure that users understand the characteristics of the chatbots, so they make a proper use of it. On the other hand, this process of diffusion and adoption will also depend people's mentalities and openness towards this wave of technological transformation. There is a pattern of technologies that fail because they are launched in the wrong time. It might be that individuals are still not ready for this type of technological way of living, but as any new technology there is a period of adoption cycle.

9. References

Accenture. 2016. “Chatbots in Customer Service”.

Accenture. 2017. “Boost Your AIQ: Transforming into an AI Business”.

Accenture. 2017. “Embracing the Disruptive power of Chatbots”.

Accenture. 2017. “Why is Artificial Intelligence Important?”

Accenture. 2018. “Chatbots are Here to Stay”.

Arasada, Srinivas. 2018. “Chatbots: A Powerful Weapon in The Business Arsenal**”** in *Forbes.*

Bank of America. 2018. “Bank of America Surpasses 1 Million Users on Erica”.

Barfield, Woodrow and Alexander Williams. 2017. “Cyborgs and Enhancement Technology” in *Philosophies* ed. Jordi Vallverdú, 2(1):4.

Brandtzæg, Petter Bae and Asbjørn Følstad. 2017. “Why People Use Chatbots” in *Lecture Note in Computer Science.* SINTEF.

Brandtzæg, Petter Bae and Asbjørn Følstad. 2018, “Chatbots: changing user needs and motivations” in *Interactions,* 25(5): 38-43.

Curry, Collette and James Dominic O'Shea. 2011. “The implementation of a storytelling chatbot”. Conference Paper: Agent and Multi-Agent Systems: Technologies and Applications - 5th KES International Conference, KES-AMSTA 2011. Manchester, UK.

Dahlberg, Tomi. 2003. “Trust enhanced technology acceptance model-consumer acceptance of mobile payment solutions: Tentative evidence”. Turku School of Economics.

Dale, Robert. 2016. “The Return of Chatbots” in *Natural Language Engineering,* 22 (5): 811–817. Cambridge: Cambridge University Press.

Deloitte. 2018. “Chatbots Point of View”. Netherlands.

Dupree, Yolanda. 2015. “Determinants of Intention to Use New Technology: An Investigation of Students in Higher Education”. College of Engineering and Computing, Nova Southeastern University.

Hall, Bronwyn H. and Beethika Khan. 2002. “Adoption of New Technology”. NBER Working Paper No. 9730, 1-7. Cambridge, MA: National Bureau of Economics Research.

Hall, MA. and E. Dugan and B Zheng and AK Mishra. 2001. “Trust in physicians and medical institutions: what is it, can it be measured, and does it matter?” in *Milbank Quarterly,* 79(4):613-39. Wake Forest University.

Hosmer, L. T. 1995. “Trust: The connecting link between organizational theory and philosophical ethics” in *Academy of Management Review*, 20: 379-403. Academy of Management.

Hyken, Shep. 2017. “AI And Chatbots Are Transforming The Customer Experience” in *Forbes.*

Hyken, Shep. 2017. “Half of People Who Encounter Artificial Intelligence Don’t Even Realize It” in *Forbes.*

Kyriakou, Artenis. 2018. “Intelligence and Speculative Prosthetics”. Aristotles University of Thessaloniki, Faculty of Engineering.

Luhman, Niklas. 1975. *Trust and Power.* Cambridge: Polity Press.

Marques, Mariana. 2018. “Top 3 chatbots that are changing the travel industry” in *Medium.*

Mayer, Roger C. and James H. Davis and F. David Schoorman. “An Integrative Model of Organizational Trust”. Academy of Management.

Mayo, John S. 1985. “The Evolution of Information Technologies” in *Information Technologies and Social Transformation* ed. Bruce R. Guile, 7-34. Washington D.C: National Academy Press.

McGregor, Douglas M. 1957. “The Human Side of Enterprise” in *From Leadership and Motivation, Essays of Douglas McGregor* ed. W. G. Bennis and E. H. Schein, 3-20. Cambridge, MA: MIT Press.

Milgram, S. 1963. “Behavioral study of obedience” in *Journal of Abnormal and Social Psychology*, 67: 371–378.

Munasinghe, PG. 2014. “Technology Acceptance and Adoption: The Case of Internet Banking”. Faculty of Management Studies, Rajarata University of Sri Lanka.

Nordheim, Cecilie Bertinussen. 2018. “Trust in Chatbots for Customer Service”. Department of Psychology, University of Oslo.

Ouellette, Alexandre. 2018. “The 17 Tech Buzzwords You Need to Know In 2018” in *Career Foundry.* Retrieved from: https://careerfoundry.com/en/blog/web-development/tech-buzzwords-to-learn/

Oxford Dictionary. 2018. Oxford University Press. Viewed 20 September 2018.

Piccolo, Lara S. G.; Shadrock Roberts; Anna Iosif and Harith Alani. 2018. “Designing Chatbots for Crises: A Case Study Contrasting Potential and Reality” in *Proceedings of the British HCI Conference*, 4-6. Belfast.

Pulse Chat. 2017. “How Much You Should Trust Chat Bots?”

Rossi, Ben. 2017. “Rise of the chatbot: security concerns” in *Information Age.* Retrieved from: https://www.information-age.com/rise-chatbot-security-concerns-123467697/.

Rousseau, Denise M. and Sim Sitkin and Ronald S. Burt and Colin Farrell Camerer. 1998. “Not So Different After All: A Cross-discipline View of Trust” in *The Academy of Management Review,* 23: 393-404. Carnegie Mellon University.

Rubas, Debra. 2004. “Technology Adoption: Who Is Likely to Adopt and How Does the Timing Affect the Benefits?”. Texas A&M University.

Silver, A. 1985. "'Trust' in social and political theory" in *The Challenge of Social Control,* ed. G. D. Suttles and M. N. Zald, 52.

Swedberg, Richard. 2005. "Can There be a Sociological Concept of Interest?" in *Theory and Society*, 34: 359-390. Springer.

Sztompka, Piotr. 1999. *Trust: A Sociological Theory*. Cambridge: Cambridge University Press.

The Medical Futurist. 2018. "The Top 12 Health Chatbots".

The World Bank. N.d. "Science and Technology: Research and Development Expenditure (% of GDP). Retrieved from https://data.worldbank.org/topic/science-and-technology.

Turing, A. M. 1950. "Computing Machinery and Intelligence" in *Mind,* 49: 433-460.

Zamora, Jennifer. 2017. "I'm Sorry, Dave, I'm Afraid I Can't Do That: Chatbot Perception and Expectations"

10. Appendix

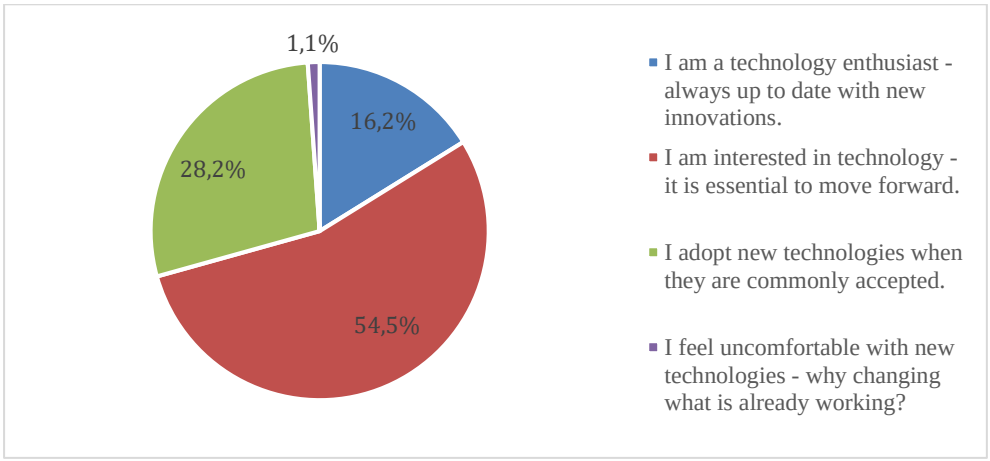
Appendix 1: Chatbot Categorization

Informational chatbots	"Informational bots uncover useful information and resolve customer and employee inquiries. They move beyond conventional search results to provide customer-and context-specific results that can be accessed via voice, text, or visuals, thereby reducing the effort required to get accurate results."
Transational chatbots	"Transactional bots serve as powerful interfaces for mobile applications through which customers can book tickets, order food, and manage bank accounts. Such bots are still in their infancy—retailers, for instance, have launched bots to provide customer service or offer shoppers another way to browse, but the bots lack a payments functionality."
Enterprise Productivity	"Custom enterprise bots, an emerging application of the technology, can connect to enterprise data resources, streamline enterprise work activities, and improve efficiencies. Employees can use these bots to, for example, check sales numbers, determine the performance of marketing campaigns, or monitor inventory status."
Device Control	"Device control bots support conversational interfaces that enable connected devices such as wearables, home appliances, and vehicles to interact with each other—thus enriching the user experience. For example, devices with virtual assistants such as smartphones and smart home speakers can work with smart home devices like thermostats, switches, and lights."

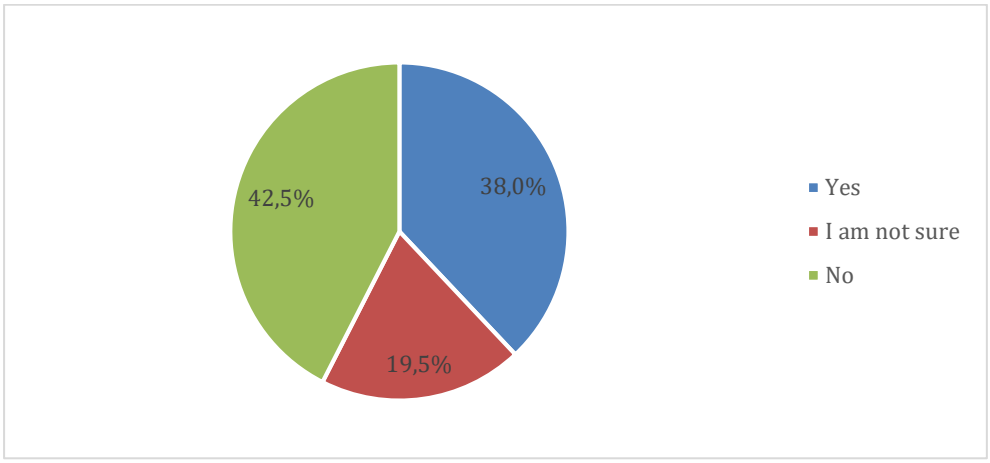
Source: Accenture, 2018. "Chatbots are Here to Stay".

Appendix 2: Answers from the online questionnaire.

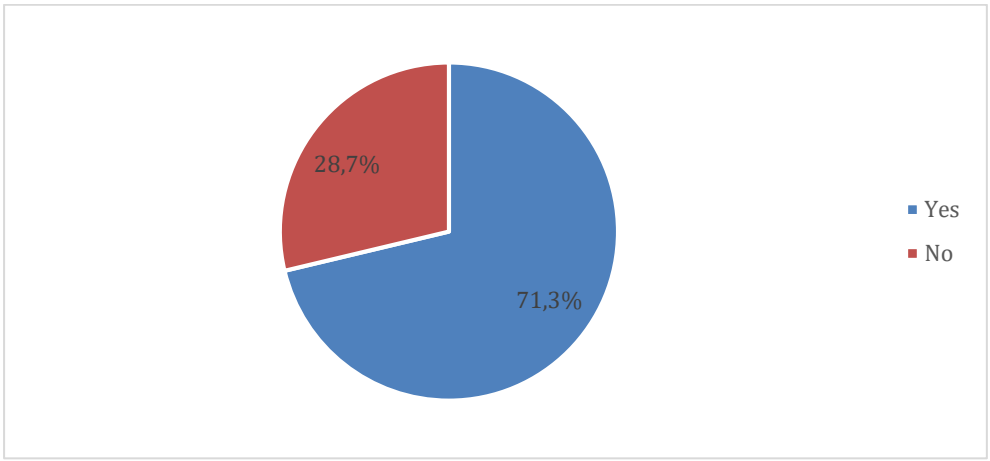
2.1. Which of the following statement best describes you?



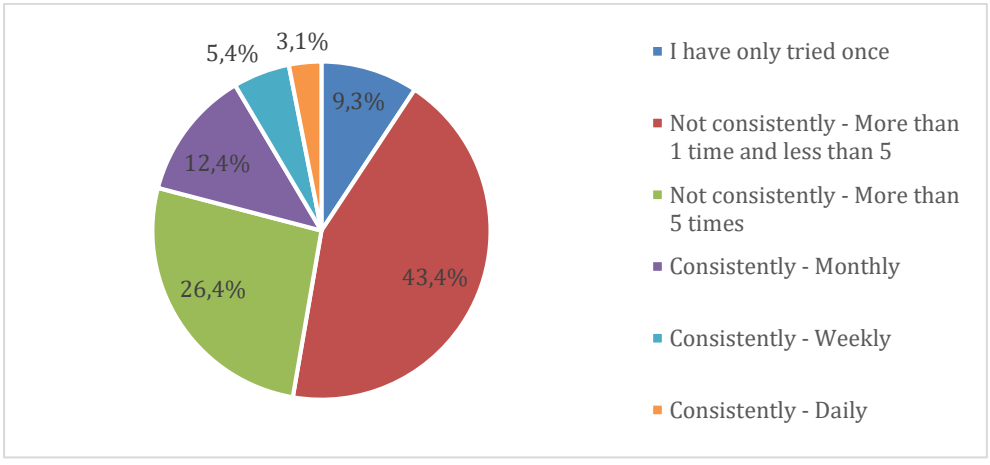
2.2. Do you know what Chatbots are?



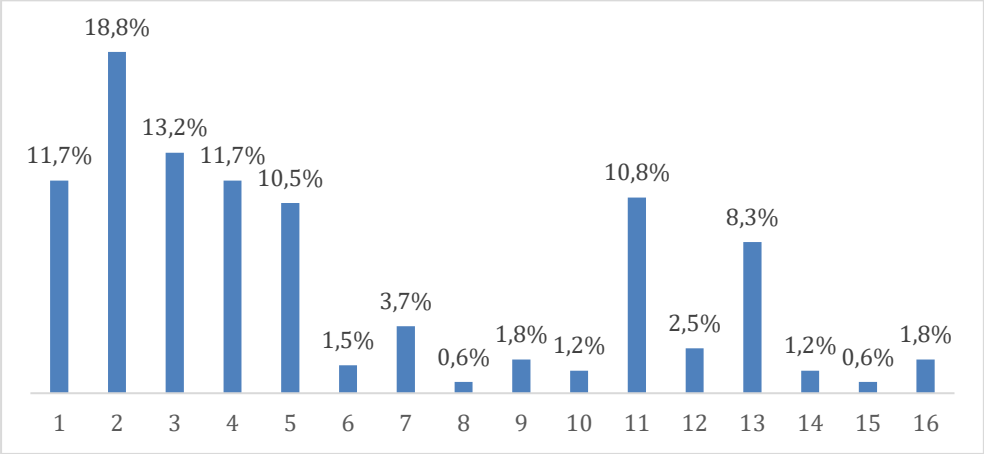
2.3. Have you used a Chatbot before?



2.4. How often do you use Chatbots?

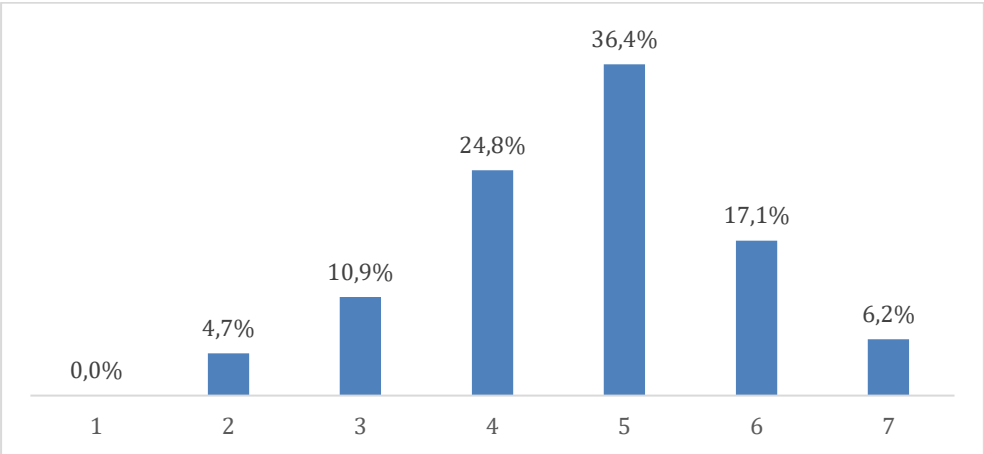


2.5. Select the situation(s) in which you used a Chatbot. (Please select all that apply)

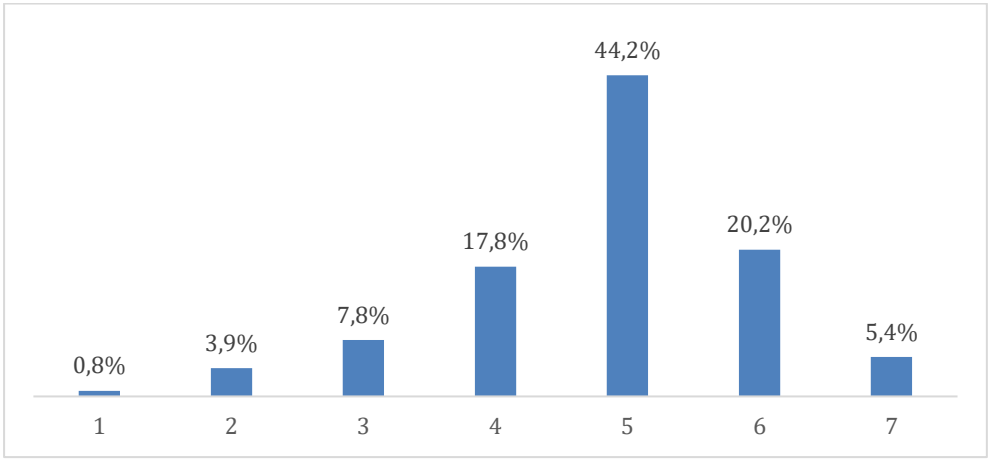


1 - Getting a quick answer in an emergency
2 - Resolving a complaint or problem
3 - Getting detailed answers or explanations
4 - Finding a human customer service assistant
5 - Making a reservation (e.g. restaurant or hotel)
6 - Paying a bill
7 - Buying a basic item
8 - Buying an expensive item
9 - Getting ideas and inspiration for purchases
10 - Adding yourself to mailing list or news service
11 - Getting daily information (e.g. weather forecast or traffic)
12 - Getting advice (e.g. medical, fashion, touristic, new recipes, etc.)
13 - General information (e.g. world statistics, politics, economy, etc.)
14 - Financial assistance (e.g. investment advice)
15 - Personal aid (e.g. insomnia or quite smoking)
16 - Other

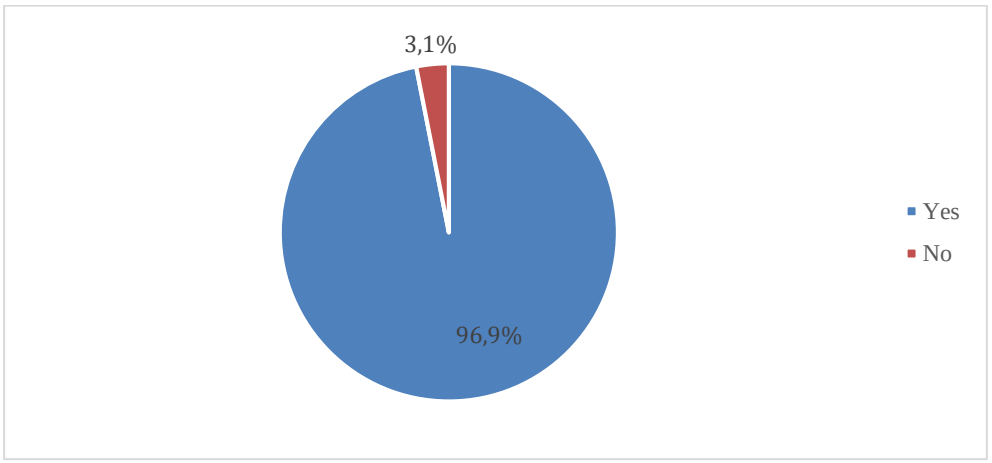
2.6. Do you trust Chatbots? How would you rate that level of confidence? (1="I absolutely do not trust Chatbots" and 7="I totally trust Chatbots")



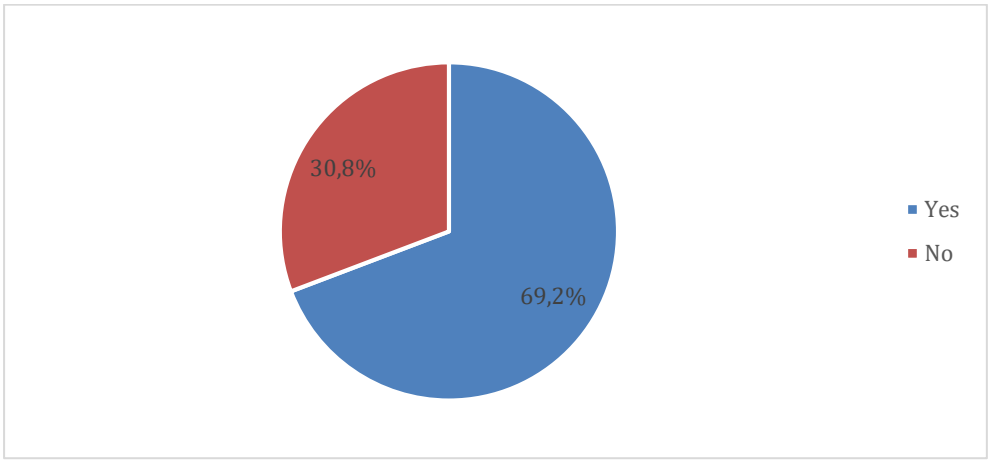
2.7. How would you rate your overall experience when using Chatbots? (1="Terrible experience" and 7="Amazing experience")



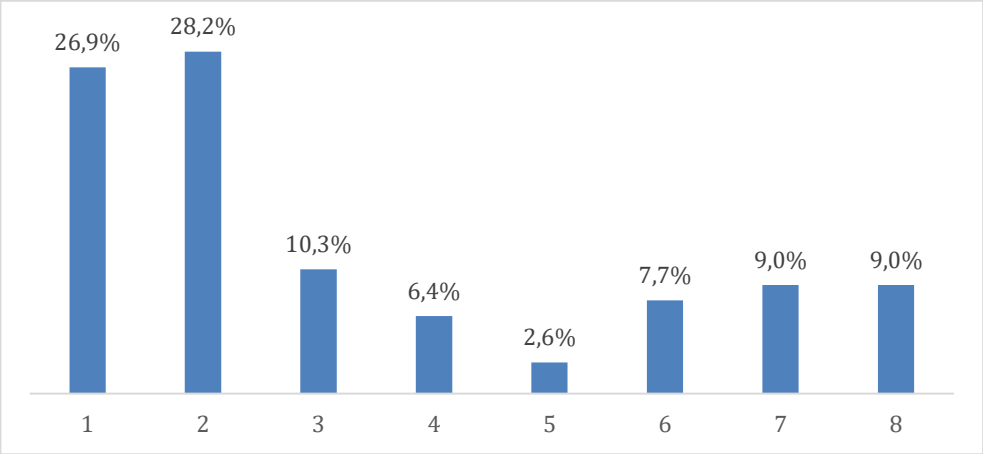
2.8. Would you use a Chatbot again?



2.9. Would you use a Chatbot?

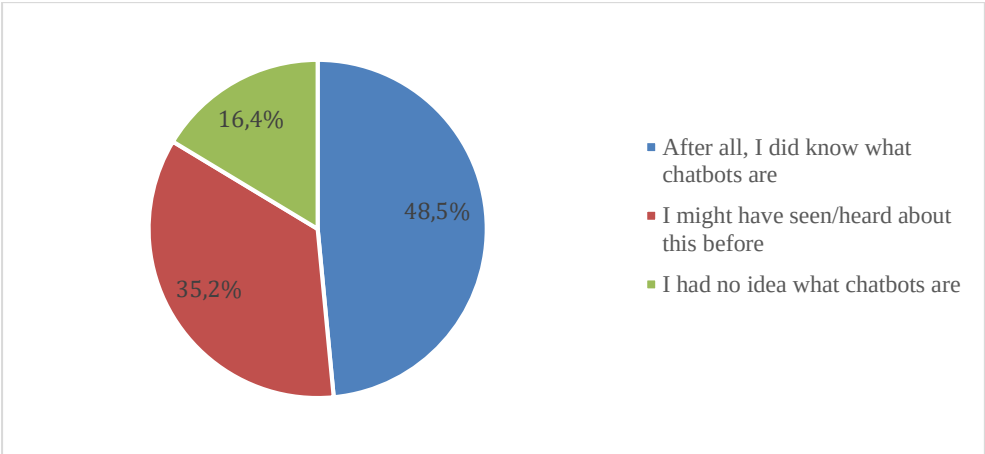


2.10. Why have you never used a Chatbot? (Please select all that apply)

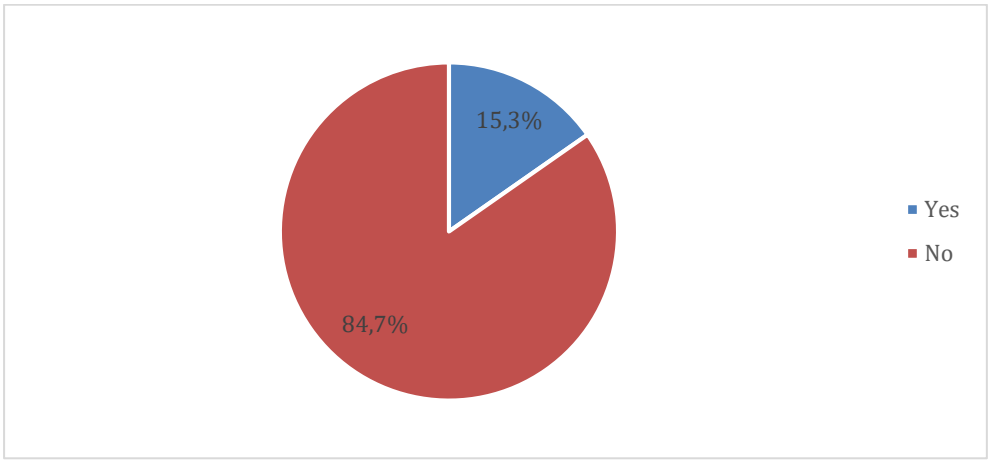


1 - I don't know in which cases I can use a Chatbot
2 - It doesn't come to my mind using a Chatbot
3 - I don't feel comfortable interacting with a robot
4 - I don't trust robots
5 - I have heard about poor experiences with Chatbots
6 - I don't want to contribute for automation processes that can replace human professionals
7 - I don't think Chatbots are that useful
8 - I never came across a Chatbot and I don't want to look for one

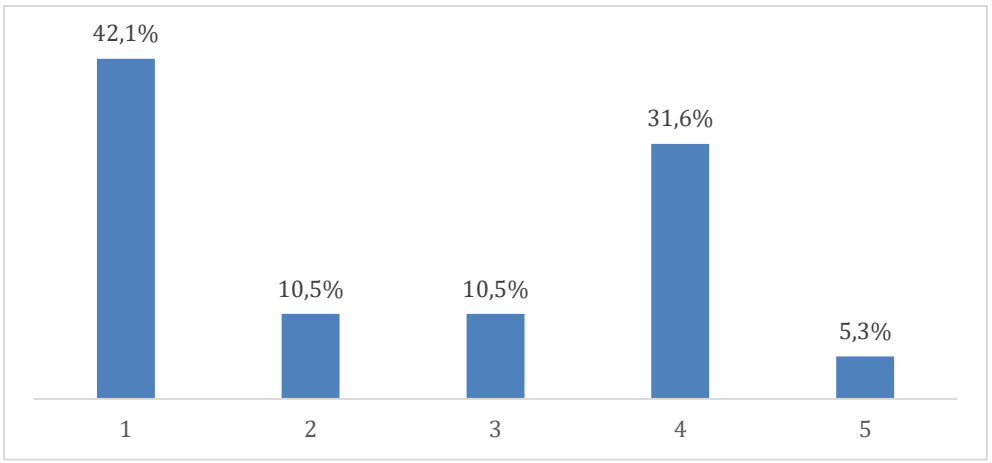
2.11. After this explanation, do you maintain your previous answer?



2.12. Now that you know what a Chatbot is, would you use one?

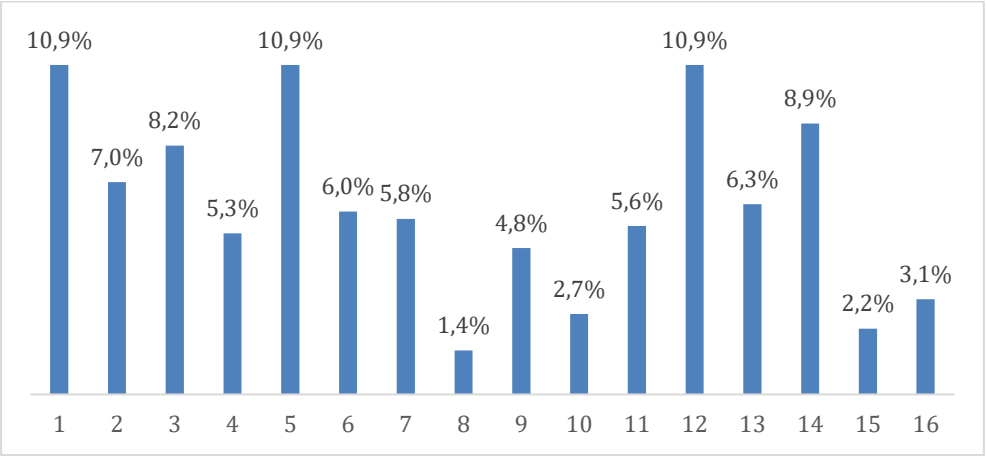


2.13. Why wouldn't you use a Chatbot? (Please select all that apply)



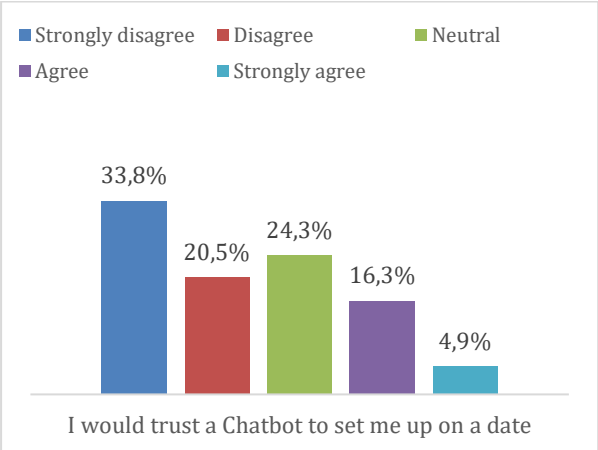
1 - I don't feel comfortable interacting with a robot
2 - I don't trust robots
3 - I have heard about poor experiences with technologies like these
4 - I don't want to contribute for automation processes that can replace human professionals
5 - I don't think Chatbots are that useful

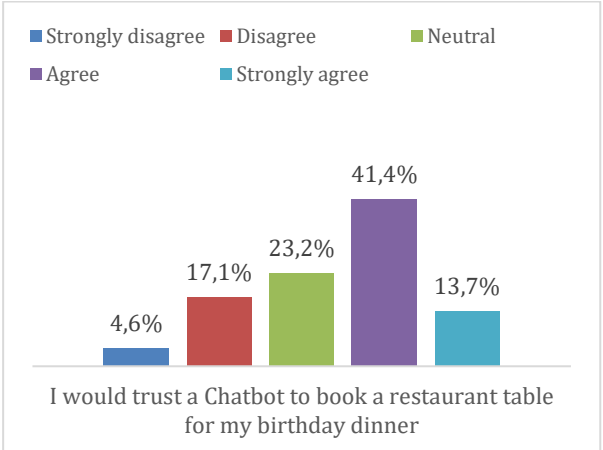
2.14. Select the situation(s) in which you would use a Chatbot. (Please select all that apply)

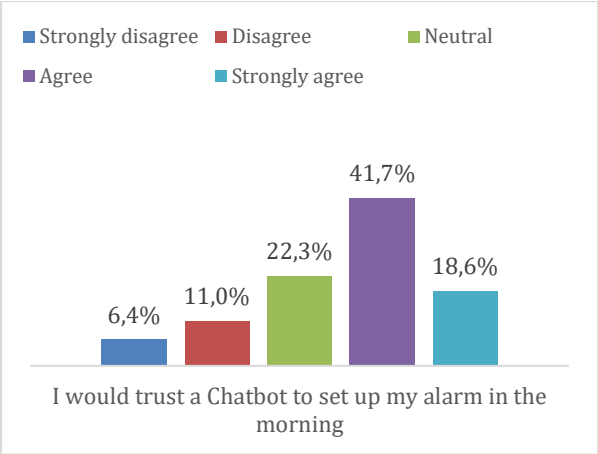


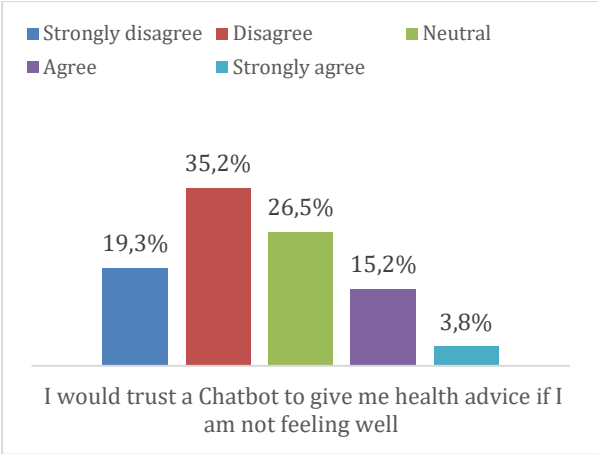
1 - Getting a quick answer in an emergency
2 - Resolving a complaint or problem
3 - Getting detailed answers or explanations
4 - Finding a human customer service assistant
5 - Making a reservation (e.g. restaurant or hotel)
6 - Paying a bill
7 - Buying a basic item
8 - Buying an expensive item
9 - Getting ideas and inspiration for purchases
10 - Adding yourself to mailing list or news service
11 - Communicating with multiple brands using a single program
12 - Getting daily information (e.g. weather forecast or traffic)
13 - Getting advice (e.g. medical, fashion, touristic, new recipes, etc.)
14 - General information (e.g. world statistics, politics, economy, etc.)
15 - Financial Assistant (e.g. investment advice)
16 - Personal Aid (e.g. insomnia or quite smoking)

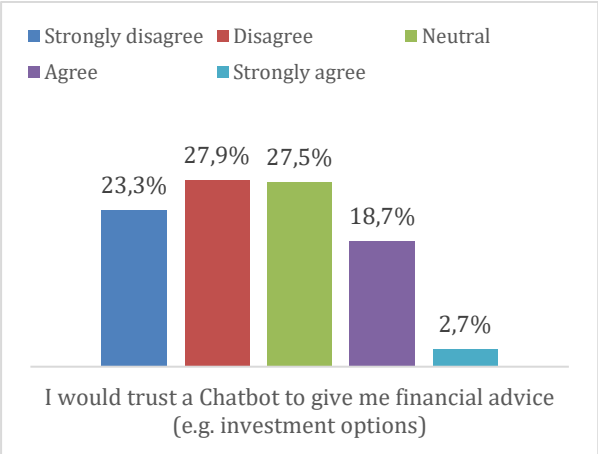
2.15. Evaluating the level of trust

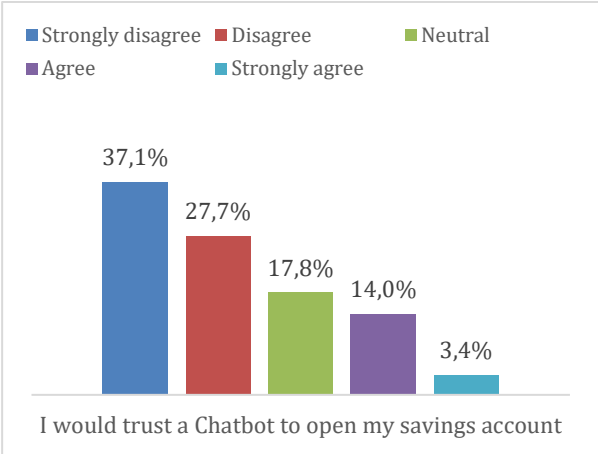




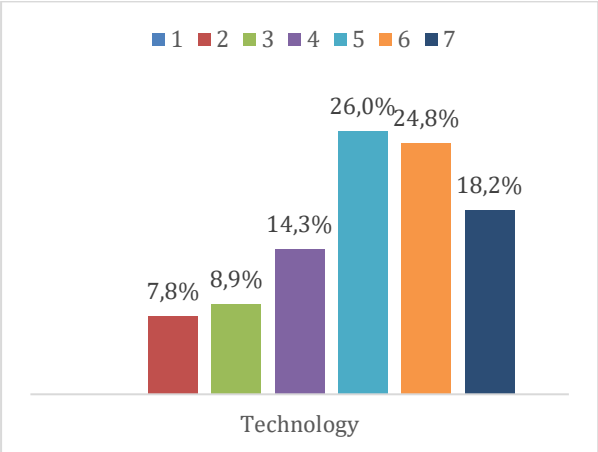


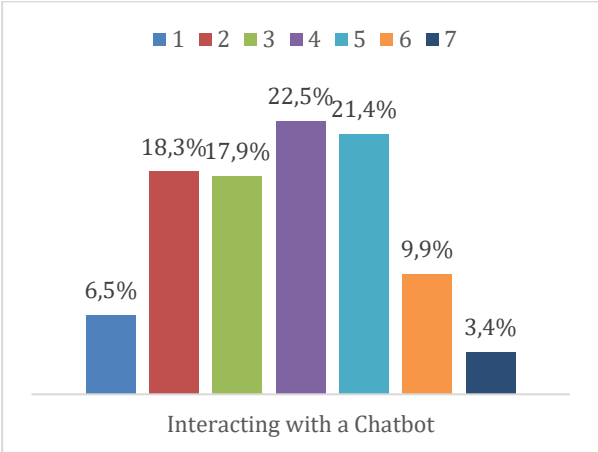


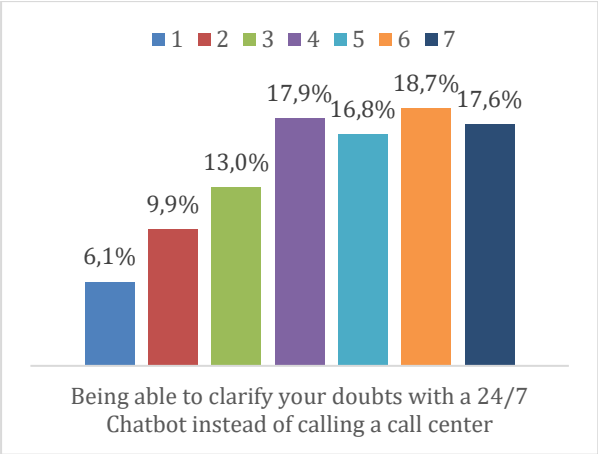


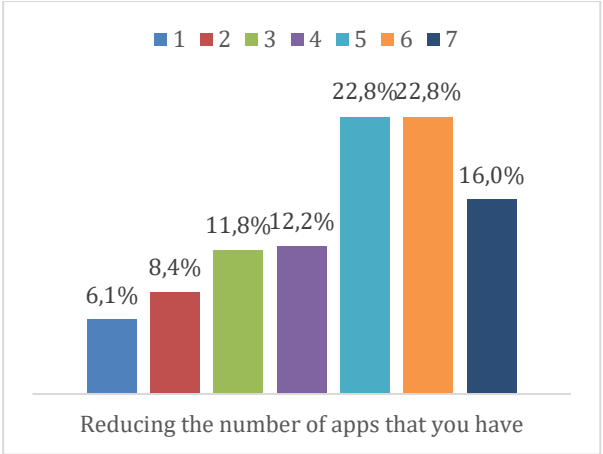


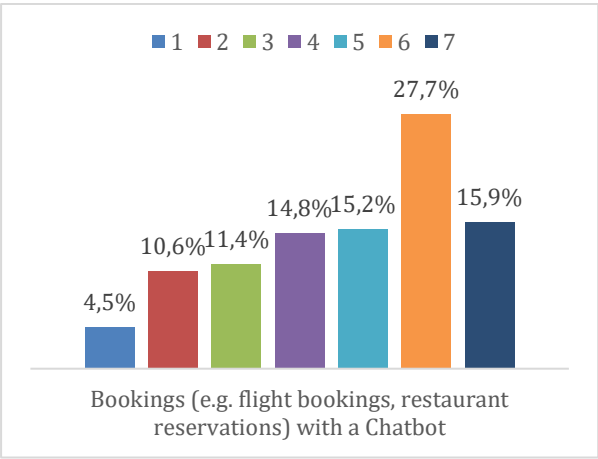
2.16. Please rate your overall interest in: (1="Not interested at all" and 7="Extremely interested")

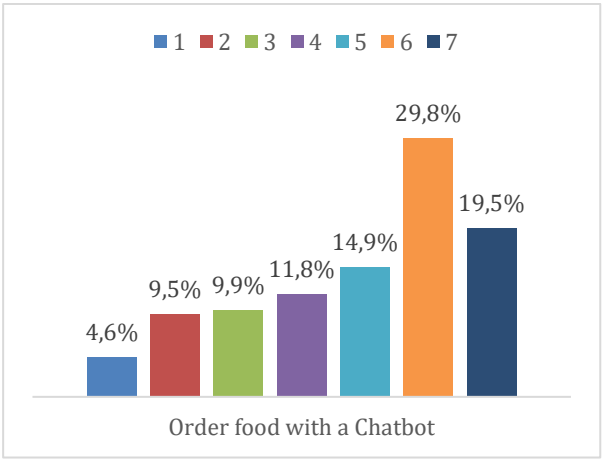




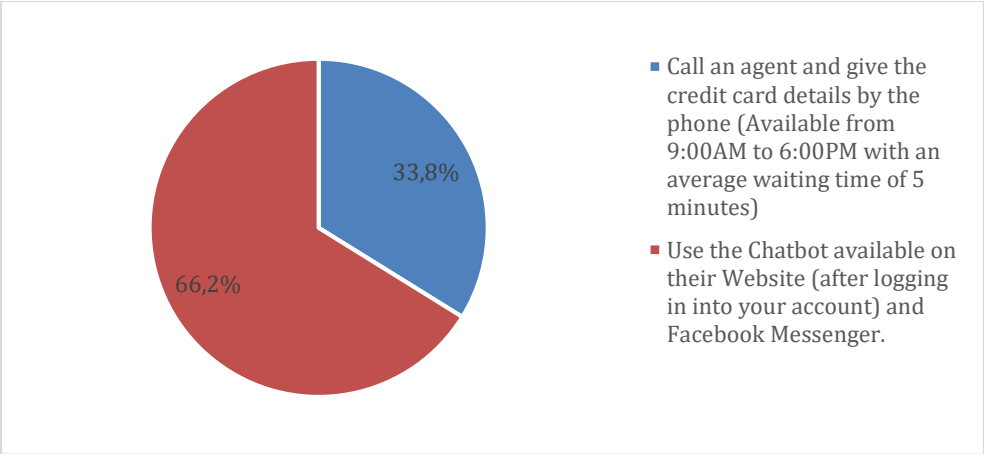




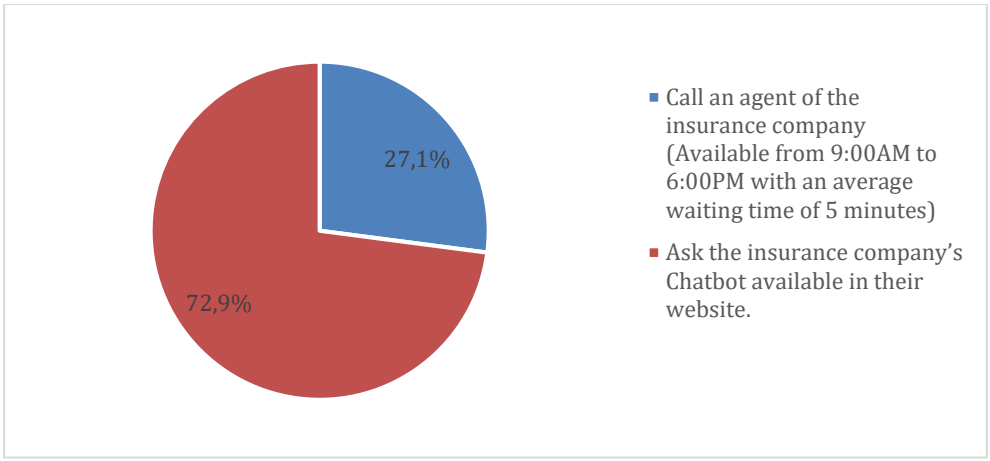




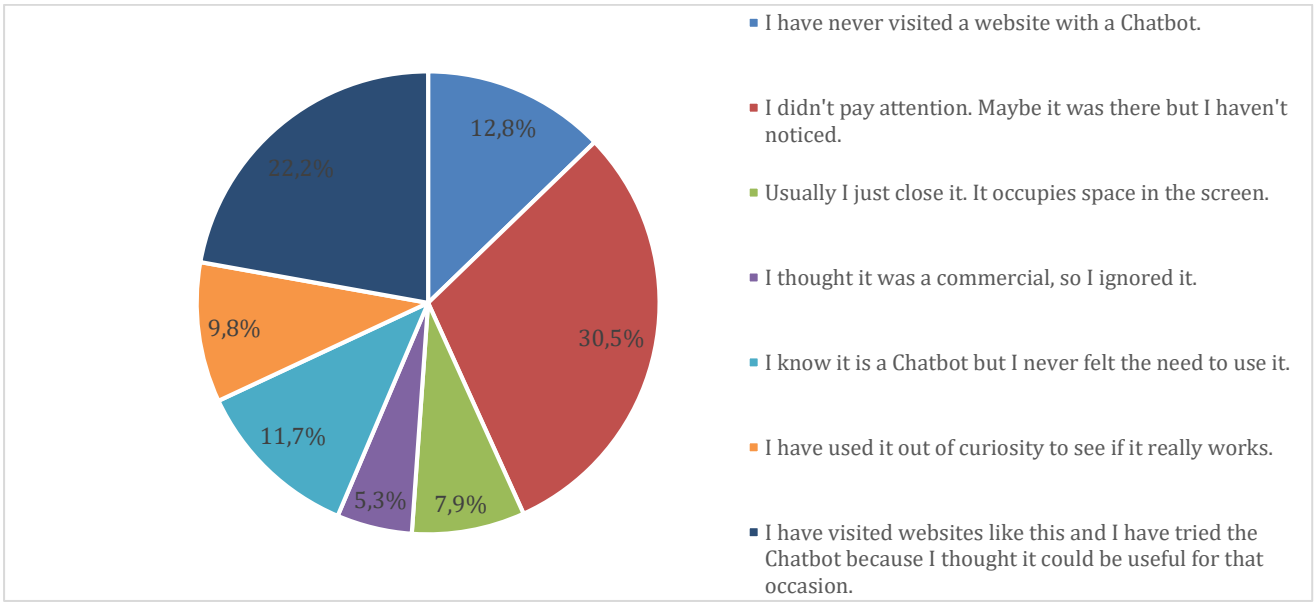
2.17. To pay for your trip to a tropical island you have to provide the travel agency with your Credit Card details. You have 2 options. Please select the one you would prefer.



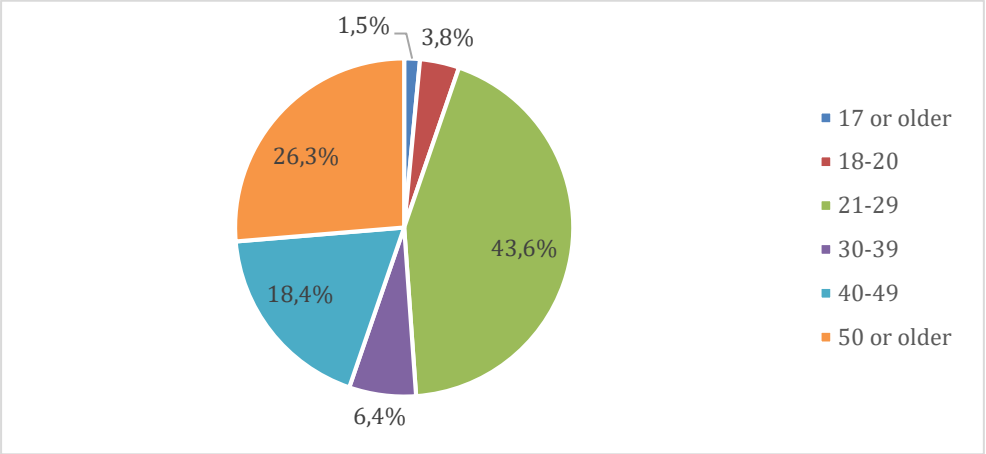
2.18. During your trip you were not careful enough and got sunburned. You feel you should go to the doctor but you are not sure if your Health Insurance will cover that. To find out that information you have 2 options. Please select the one you would prefer.



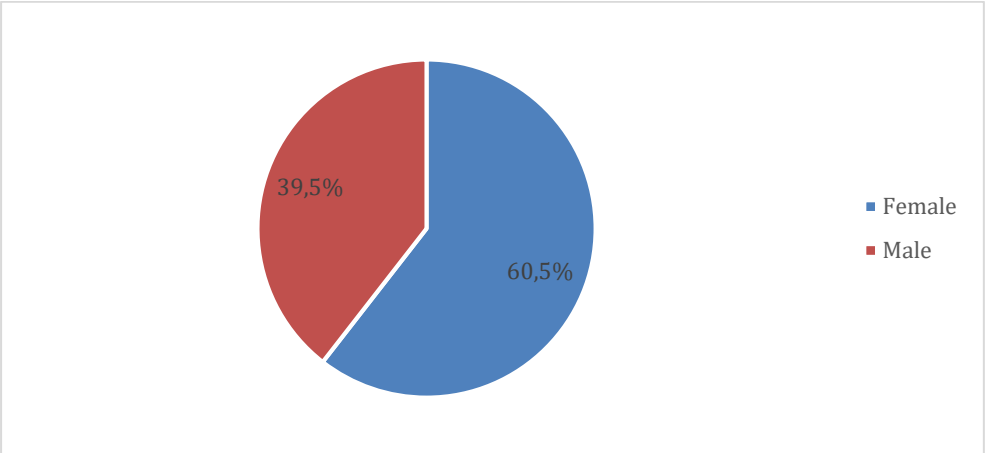
2.19. If you have already visited a website with a Chatbot (as illustrated in the picture above), what was your reaction?



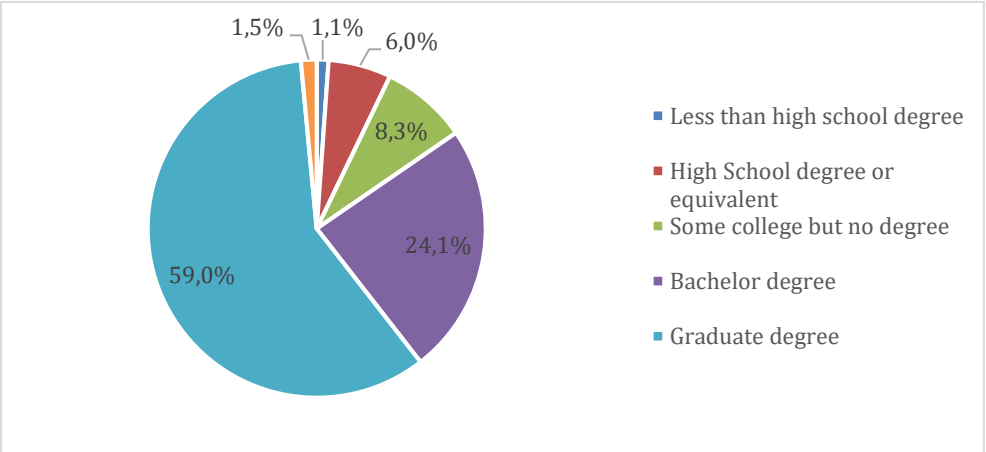
2.20. Age



2.21. Gender



2.22. Education



2.23. Nationality

Country	Respondents
Albania	0,4%
Argentina	0,8%
Azerbaijan	0,4%
Belgium	0,4%
Brazil	3,4%
China	0,4%
Denmark	0,4%
England	0,4%
France	1,5%
Germany	1,5%
Italy	0,8%
Japan	0,4%
Malaysia	0,4%
Morocco	0,4%
Norway	0,4%
Poland	0,4%
Portugal	83,1%
Saudi Arabia	0,4%
Sierra Leone	0,4%
Spain	1,9%
United Kingdom	0,4%
USA	1,9%